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Docket No.: 09450/0204219-US0  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Kazunori Yoshino

Application No.: National Phase of  
PCT/JP2005/006628

Confirmation No.: N/A

Filed: Concurrently Herewith

Art Unit: N/A

For: WASTE ENERGY RECOVERY METHOD  
AND WASTE ENERGY RECOVERY SYSTEM

Examiner: Not Yet Assigned

**FIRST PRELIMINARY AMENDMENT**

MS PCT  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

**INTRODUCTORY COMMENTS**

Prior to examination on the merits, please amend the above-identified U.S. patent application as follows:

**Amendments to the Specification** begin on page 2 of this paper.

**Amendments to the Abstract** begin on page 3 of this paper.

**Amendments to the Claims** are reflected in the listing of claims which begins on page 4 of this paper.

**Remarks/Arguments** begin on page 7 of this paper.

**AMENDMENTS TO THE SPECIFICATION**

Substitute Specification

Please find attached a marked-up copy and a clean copy of the substitute specification. No new matter has been added. Kindly replace the specification with the clean substitute specification attached.

**AMENDMENTS TO THE ABSTRACT**

Please substitute the following paragraph(s) for the abstract now appearing in the currently filed specification:

--An oil cooler for cooling hydraulic oil that has increased in temperature due to energy loss in a hydraulic circuit a radiator for cooling engine cooling water that has increased in temperature as a result of cooling an engine and an ATAAC for cooling engine intake air that has increased in temperature as a result of being compressed by a turbocharger, are provided with heat pipes for vaporizing low-boiling medium by absorbing heat from the oil cooler the radiator and the ATAAC. A power recovery turbine is rotated by energy provided by vaporized low-boiling medium is provided for the engine. A low-boiling medium circuit is provided so as to drive the turbine by feeding the low-boiling medium that has been vaporized by waste heat energy. The low-boiling medium circuit includes the heat pipes of the oil cooler the radiator, and the ATAAC, as well as the turbine.--

### **AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application:

#### **Listing of Claims:**

Claim 1 (Cancelled).

Claim 2 (Currently amended): A waste heat energy recovery system comprising:  
an oil cooler for cooling hydraulic oil that has increased in temperature as a result of loss of energy in a hydraulic circuit that includes a pump adapted to be driven by an engine;  
another cooling ~~means~~device for cooling another fluid that has increased in temperature as a result of operation of said engine;  
a turbine for recovering driving power, said turbine provided for said engine and adapted to be rotated by energy provided by a vaporized low-boiling medium; and  
a low-boiling medium circuit serves to drive said turbine by providing said turbine with the low-boiling medium that has been vaporized by waste heat energy from the oil cooler and the aforementioned other cooling means;

wherein said turbine is connected to a power transmission system that branches off from a power transmission unit that enables said engine to drive said pump.

Claim 3 (currently amended): A waste heat energy recovery system as claimed in claim 2, wherein:

said other cooling ~~means~~device is a radiator for cooling engine cooling water that has increased in temperature as a result of cooling said engine.

Claim 4 (currently amended): A waste heat energy recovery system as claimed in claim 2, wherein:

said other cooling ~~means~~device is an intake air cooler for cooling engine intake air that has increased in temperature as a result of being compressed by a turbocharger.

Claim 5 (Currently amended): A waste heat energy recovery system comprising:  
an oil cooler for cooling hydraulic oil that has increased in temperature as a result of loss of energy in a hydraulic circuit that includes a pump adapted to be driven by an engine;

a radiator for cooling engine cooling water that has increased in temperature as a result of cooling said engine;

an intake air cooler for cooling engine intake air that has increased in temperature as a result of being compressed by a turbocharger;

a turbine for recovering driving power, said turbine provided for said engine and adapted to be rotated by energy provided by a vaporized low-boiling medium; and

a low-boiling medium circuit serves to drive said turbine by providing said +turbine with the low-boiling medium that has been vaporized by waste heat energy from the oil cooler and said other cooling means;

wherein said turbine is connected to a power transmission system that branches off from a power transmission unit that enables said engine to drive said pump.

Claim 6 (currently amended): A waste heat energy recovery system as claimed in ~~any one of the claims from claim 2 to claim 5~~, wherein said a low-boiling medium circuit comprises:

heat pipes that permit a part of the low-boiling medium that is fed from a low-boiling medium pump to an evaporator of an air conditioning device circuit to branch off from said air conditioning device circuit and pass through said oil cooler and said other cooling ~~means~~device so that said low-boiling medium vaporizes by absorbing heat from said oil cooler and said other cooling ~~means~~device,

wherein said air conditioning device circuit ~~comprising~~comprised:

a compressor, a condenser, a receiver, said low-boiling medium pump, an expansion valve, and said evaporator, all of which are installed in a construction machine and connected to one another in an endless circuit;

a feed line serving to provide said turbine with the low-boiling medium that has been vaporized inside said heat pipes; and

return line serving to recirculate the low-boiling medium from said turbine to the intake end of said compressor of said air conditioning device circuit.

Claim 7 (Cancelled).

**REMARKS**

The specification is amended in accordance with 37 CFR §1.78 to make reference to the International Application from which this application originates and to incorporate by reference the Japanese priority applications. Also the specification is amended to conform to U.S. practice and correct typographical errors. A marked-up copy and a clean copy of the substitute specification are provided.

Claims 1, 2, 5 and 7 have been amended under Article 19 on August 1, 2005 but these amendments are incorporated herein in the Preliminary Amendment. Claims 1 and 7 have been canceled without prejudice. Claim 6 has been amended to eliminate multiply dependency. The amendment is made to reduce filing fees and not for any other reason related to patentability of such claim. Claims 2-5 have been amended to put them in conformity with US claiming style.

Abstract has been amended to conform to US practice.

No new matter has been added by these amendments.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

Dated: April 20, 2006

Respectfully submitted,

By 

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